

1-4 as being indefinite under 35 U.S.C. §112, second paragraph. Claims 2-4 have been amended to improve their form. No new matter has been introduced. Claims 1-4 are in the case.

Claims 1-4 are rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over Nitto.

Claims 1-4 are further rejected under 35 U.S.C. §103(a) as being unpatentable over the Japanese IND KK reference (hereinafter "the Matsushita reference") in view of any one of Vogdes et al. or Davis et al. or Nitto.

Claims 1-4 are still further rejected under 35 U.S.C. §103(a) as being unpatentable over Nitto in view of either Vogdes et al. or Davis et al.

All of these rejections are respectfully traversed.

#### NITTO

The Nitto reference uses a medium-diameter tubular body and a large-diameter tubular body, both having thermal shrinkage properties. To impart the thermal shrinkage property to an article of a fluorine-containing resin, such as PTFE or modified PTFE, the article is heated to a temperature higher than the melting point of the resin, stretched, and then cooled or quenched while it is maintained in the stretched state.

In contrast, the premolded parts used in the present invention are produced at a temperature **lower than the melting point** of modified PTFE (see page 6, lines 20-25, of the present specification). Thus, the present invention is not anticipated by Nitto.

Furthermore, Nitto fails to teach or suggest joining premolded parts of modified PTFE having **different** coefficients of thermal shrinkage. Thus, the present invention is not obvious from Nitto.

#### MATSUSHITA

The present invention is distinguished from the Matsushita reference in that the resins to be processed are all melt-processable (extrudable) ones. Furthermore, the secondary references teach only melt-processable fluororesins. For example, Davis et al. describe Tefzel™, which is an ethylene-tetrafluoroethylene copolymer, and Vogdes et al. describes "polyvinylidene fluoride, ethylene/chlorotrifluoroethylene copolymer and vinylidene fluoride hexafluoropropylene copolymer".

In order to establish that these fluoropolymers are melt-processable, submitted concurrently herewith are the following references:

1. *Halar Fluoropolymer* (published by Central Glass Co., Ltd.), which states on page 1, lines 3-6:

HALAR Resin is a fluoro-resin developed by Allied Corporation, USA, which is suitable for melt-molding and its basic structure is an alternating copolymer of ethylene ( $\text{CH}_2=\text{CH}_2$ ) and chlorotrifluoroethylene ( $\text{CF}_2=\text{CFCL}$ ) in a ratio of 1:1.

and at page 1, lines 10-12:

HALAR Resin is one of the melting type fluoro-resins like tetrafluoroethylene-hexafluoropropylene copolymer (FEP), ethylenetetrafluoroethylene copolymer (ETFE), polyvinylidene fluoride (PVDF), etc."

2. Fluorocarbon Polymers Technical Information - Neoflon CTFE Molding Powder (published by Daikin Industries Ltd.), which states on page 1, lines 2-4:

NEOFLON CTFE (polychlorotrifluoroethylene: chlorotrifluoroethylene resin) is a thermoplastic resin obtained by polymerizing chlorotrifluoroethylene.

3. Fluoro-resins Handbook (ed., Takaomi Satokawa, published by Nikkan Kogyo Shinbunsha), which states at page 362, lines 7-14:

With regard to the copolymerization of VDF, VDF has been studied and used as one of comonomers to produce fluororubbers with high performances. Various types of copolymerization are reported for the purpose of imparting wide ranges of properties to improve PVDF. One typical example is a copolymer of VDF and hexafluoropropylene. This copolymer was originally commercialized as one of fluororubbers. Recently, a copolymer having a low copolymerization ratio of hexafluoropropylene is commercialized as a thermoplastic resin.

Clearly, therefore, the fluorine-containing resins disclosed in the secondary references are all melt-processable or

thermoplastic resins, which can be molten or made plastic by heating.

In contrast, the modified PTFE of the present invention is not a melt-processable resin. This is supported by U.S. Patent No. 5,709,944 (Kokumai et al.), a copy of which is also attached. Kokumai et al. indicate, at column 1, lines 58-64:

Known as the other method to improve the creep resistance, is to copolymerize TFE with a modifier such as perfluoro(alkyl vinyl ether), or perfluoro(alkoxyalkyl vinyl ether) (JP-B-46794/1976, JP-B-31524/1984). These methods try to improve the creep resistance with keeping melt-unprocessability by copolymerization with the reforming agent.

That is, the modified PTFE retains "melt-unprocessability."

Accordingly, the present invention is not obvious from the Matsushita reference and the secondary references of record.

#### Conclusion

It is believed that a full and complete response has been made to the Office Action. Accordingly, the Examiner is respectfully requested to pass this application to Issue.


In the event there are any problems remaining in this application, the Examiner is invited to contact Mr. Richard J. Gallagher, Registration No. 28,781 at (703) 205-8008.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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**MARKED-UP COPY OF AMENDED CLAIMS:**

1. (amended) A method for producing [the] a molded article of a modified polytetrafluoroethylene by joining, comprising the steps of:

providing at least two premolded parts of modified polytetrafluoroethylene having different coefficients of thermal shrinkage [with] and allowing their joining faces to be in contact with each other or to be closely placed, and

sintering the parts to join them at the joining faces.

2. (amended) A method according to claim 1, wherein the joining of said at least two premolded parts at the joining faces is carried out without the application of an external pressure.

3. (twice amended) A method according to claim 1, wherein each of said at least two premolded parts has a coefficient of thermal shrinkage in the range between 0.2 and 10 %, and the difference [of] in the coefficient of thermal shrinkage [is from 0.2 to 9.8 %] between two premolded parts which are adjacently placed ranges from 0.2 to 9.8 %.

4. (twice amended) A method according to claim 1, wherein at least one premolded part is surrounded by another premolded part

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having a larger coefficient of thermal shrinkage than that of [at least one] the premolded part which it surrounds.